INTERNATIONAL MARITIME ORGANIZATION

IMO

E

SUB-COMMITTEE ON
RADIOCOMMUNICATIONS AND SEARCH
AND RESCUE
4th session
Agenda item 7

COMSAR 4/7/4
14 May 1999
Original: ENGLISH

EMERGENCY RADIOCOMMUNICATIONS: FALSE ALERTS AND INTERFERENCE

Interference in the 406-406.1 MHz frequency band

Note by COSPAS-SARSAT

SUMMARY

Executive summary:	This document summarises information on interference sources detected by COSPAS-SARSAT participants in the 406-406.1 MHz frequency band.
Action to be taken:	Paragraph 10
Related documents:	None

Introduction

1 Article 22 (S15) of the Radio Regulations requests Administrations to cooperate in the elimination of harmful interference to transmissions on the distress and safety frequencies. The Recommendation ITU-R SM.1051-2 "Priority of Identifying and Eliminating Harmful Interference in the Band 406-406.1 MHz" includes the same request and establishes a procedure for Administrations to communicate directly to resolve interference problems.

2 To assist in the resolution of interference to the COSPAS-SARSAT 406 MHz system, the COSPAS-SARSAT Council at its Nineteenth Session in October 1997 decided to provide information on 406 MHz interference sources detected by COSPAS-SARSAT to international organizations interested in the performance of the COSPAS-SARSAT System (i.e. IMO, ICAO and ITU).

3 This document was prepared by the COSPAS-SARSAT Secretariat and agreed by the COSPAS-SARSAT Parties. It summarises information on 406 MHz interference sources detected by COSPAS-SARSAT Participants in 1997 and 1998. The information on interference detected from 1991 to 1996, which was already provided to COMSAR 3, is included for reference. However, it should be noted that significant changes to the reporting procedure were introduced in 1997 and 1998, as explained below. Therefore, no direct comparisons can be made in terms of statistics. The COSPAS-SARSAT Council wish to convey their thanks to Administrations who assisted in the resolution of many interference problems during 1997 and 1998.

Effect of interference on the COSPAS-SARSAT 406 MHz system

4 The 406 MHz band was allocated by the ITU for low-power EPIRBs. However, unauthorised signal sources in various areas of the world are emitting signals in the 406.0 to 406.1 MHz band which interfer with the COSPAS-SARSAT System. These sources are not 406 MHz beacons, but operate either in the 406 MHz band or at some other frequency and produce unwanted emissions in the 406 MHz band. Interference degrade the performance of the COSPAS-SARSAT 406 MHz system and reduce the probability of detecting real beacon transmissions.

Monitoring and reporting 406 MHz interference

5 Conventional land-based interference monitoring methods are not suitable for an international satellite system providing global coverage. Fortunately, the COSPAS-SARSAT satellite system itself can be used to detect and locate many of the interference sources world-wide, if the interference signals are monitored at suitably equipped earth receiving stations (i.e. Local User Terminals with this capability).

6 COSPAS-SARSAT Ground Segment Operators are encouraged to provide monthly interference reports on interferers to the COSPAS-SARSAT Secretariat and to provide reports to the ITU in accordance with their national procedures and ITU requirements. A new reporting procedure for "persistent" interferers was introduced in 1998. An interfering source is considered persistent when it has been detected by 10% or more of the available SARSAT satellite passes at or above a 5° elevation angle (measured from the interference source). A persistent interferer case remains open and continues to be reported by COSPAS-SARSAT Ground Segment operators until no emissions are detected for a period of 60 days. When an interferer significantly degrades System performance, Ground Segment Operators are also encouraged to inform the search and rescue authorities in the area where the interferer is located.

Summary report on interference in the 406 - 406.1 MHz band

7 The report provided as the annex to this document shows all interference sources reported by COSPAS-SARSAT Participants during the period 1991 to 1996, and the persistent interference sources reported according to the procedure described above during 1997 and 1998. Because of the change in the reporting procedure, the decrease in the number of interference sources observed in 1997 does not reflect a real improvement. Two asterisks denote the interference sources for which a confirmation of elimination was received in 1998.

8 A significant number of interference problems have been successfully resolved through cooperation with the responsible Administrations. Nevertheless, the continuation of interference in many regions and the new sources detected clearly show that the monitoring programme should be continued.

9 A number of actions have been undertaken by the providers of the COSPAS-SARSAT System to reduce, and eliminate as far as possible, the impact of interference on alert data provided by COSPAS-SARSAT. However, actions by Administrations should also be continued, through the respective national Authorities responsible for frequency management, to eliminate harmful interference in the 406-406.1 MHz frequency band.

Action requested of the Sub-Committee

10 The Sub-Committee is invited to note the information provided and decide as appropriate.

***

ANNEX

SUMMARY REPORT ON INTERFERENCE IN THE 406-406.1 MHz FREQUENCY BAND

1. COSPAS-SARSAT Monitoring Facilities

Currently, 21 COSPAS-SARSAT LUTs have the capability to carry out routine 406 MHz interference monitoring.

2. Emitters in the Band 406.0 - 406.1 MHz Reported by COSPAS-SARSAT Participants

A list of locations where 406 MHz interference sources were observed during the period 1991 to 1998 is given in the table below.

Table: Observed Locations of 406 MHz Interference (1991 - 1998)

Country	Nearest Populated Area	Last Estimated Location	1991	1992	1993	1994	1995	1996	1997	1998
Afghanistan	Dasht-i-Diwal Bast	34-48N/067-10E			√	√	√	√		
Algeria	Ait Youssef	35-56N/003-52E								√
	Alger	36-58N/002-55E								√
	Annaba (1)	36-13N/008-16E								√
	Annaba (2)	36-17N/008-08E								√
	Asilah	35-32N/006-17E						√		
	Bechar	31-29N/002-36W						√	√	√
	Bejaia	36-45N/004-31E					√	√	√	√
	Laghouat	33-48N/002-56E	√*	√*						
	Morsott	35-23N/008-12E						√		
	Sidi-Bel-Abbès	35-15N/000-48W			√*	√*				
	Tebessa	35-23N/008-02E						√	√	
Australia	Bohemia Downs	18-42S/126-45E							√	√**
	Geelong	38-09S/144-05E					√			
	Hobart	42-53S/147-19E					√*			
Bahamas		26-03N/076-03W						√		
Bosnia Herzegovina	Bihac	44-44N/015-43E		√	√	√	√			
	Bosanski Petrovbac	44-38N/016-16E				√	√			
	Kulen Vakuf	44-38N/015-47E				√	√			
	Licko Petrovo Selo	44-47N/015-43E				√*				
	Tesanj	45-03N/018-12E				√				
	Tuzla	44-54N/018-21E			√	√				
	Vrnograc	45-06N/016-04E					√			
Brazil	Chorrocho	09-13S/038-32W							√	
	Cruz-Alta	28-06S/053-57W						√		
	Itapicuru	10-25S/042-02W							√	
	Itiuba	10-43S/039-34W							√	
	Lage	10-13S/040-35W							√	
	Mairi	11-30S/039-55W							√	
	Santa Maria	29-23S/052-15W					√	√		
	Saude	10-56S/041-07W							√	
Bulgaria	Khraskovo	41-53N/025-17E								√
	Sofia	41-35N/023-08E			√					
Cameroon	Garoua	09-14N/013-27E	√*							
Canada	Labrador City	52-40N/067-51W					√			
	St. Pascal	47-30N/069-51W					√	√		
China	Beijing	39-13N/117-13E					√	√		
	Changha	28-08N/112-58E						√		
	Cixi	30-01N/121-21E					√	√	√	
	Dalian	38-50N/121-40E							√	
	Fuzhou	25-58N/119-26E						√		
	Ganzhu	25-38N/114-17E						√	√	√
	Hanghou	30-10N/119-25E		√				√		
	Jinan	36-39N/117-02E							√*	
	Jinzhou (1)	41-17N/122-00E								√
	Jinzhou (2)	41-04N/121-59E								√
	Jinzhou (3)	41-22N/122-32E								√
	Hong Kong	22-28N/114-12E		√	√		√	√		
	Madida	43-02N/130-44E						√		
	Pingsha	22-32N/114-07E						√		
	Pingtung	22-56N/120-25E			√	√	√	√	√	√
	Port Arthur (1)	39-38N/122-14E			√		√	√		√
	Port Arthur (2)	39-35N/122-11E								√
	Rudong	32-10N/121-30E							√	
	Shanghai (1)	31-20N/121-24E				√	√	√	√	√
	Shanghai (2)	31-34N/119-20E						√		√
	Shanghai (3)	31-44N/123-04E						√		
	Shaoguan	25-40N/112-49E						√		

Table (Cont): Observed Locations of 406 MHz Interference (1991 - 1998)

Country	Nearest Populated Area	Last Estimated Location	1991	1992	1993	1994	1995	1996	1997	1998
China (Cont.)	Shenzhen	22-32N/114-07E						√		
	Taipei	25-23N/121-16E						√		
	Trinjin	39-12N/117-13E			√		√			
	Wenchow	27-51N/120-48E								
	Zhanjiang (1)	21-06N/109-42E							√	√
	Zhanjiang (2)	21-14N/111-12E								√
	Zhanjiang (3)	20-46N/110-12E								√
	Zhanjiang (4)	20-59N/109-25E								√
	Zhanjiang (5)	20-58N/109-47E								√
	Zhanjiang (6)	21-08N/110-01E								√
CIS	Alma Ata	43-03N/076-11E				√				
	Astrakhan	46-38N/046-06E		√	√	√				
	Balashov	51-06N/044-19E								√
	Barnaul (1)	53-39N/083-48E								√
	Barnaul (2)	52-54N/082-54E								√
	Belorechensk	45-03N/040-41E				√				
	Beregovo	48-34N/022-48E				√				
	Borislav	49-05N/023-50E		√	√					
	Brest	52-07N/023-20E				√				
	Busk	49-47N/024-19E	√*				√			√
	Chapayevsk	53-04N/050-07E							√	
	Chernovtsy	48-17N/025-47E						√		
	Drogichin	52-01N/024-48E			√*	√				
	Dzerzinsk	53-43N/027-15E					√			
	Fergana	40-04N/071-43E								√
	Grosnyy	43-01N/044-34E				√	√	√	√	√
	Gudauta	43-06N/040-33E						√		
	Ibresi	55-31N/047-26E				√				
	Kaliningrad	54-43N/021-05E			√	√	√	√		
	Khasalakh	71-03N/125-43E						√		√
	Kiev	50-08N/028-25E	√	√						
	Kineshma	56-37N/043-27E						√		
	Kirov	58-25N/050-04E				√				
	Kosistyy	73-34N/110-13E	√							
	Kostroma	57-43N/041-27E								√
	Krasnodar	44-54N/039-10E	√	√*	√	√				
	Kumakh-Sur	71-32N/126-28E						√		√
	Leninsk Kuznetskiy	54-24N/085-07E								√*
	Lenkoran	38-47N/048-50E					√			
	Lyubotin	49-41N/035-46E								√
	Makhachkala	42-53N/047-20E						√		
	Maryevka	51-22N/048-51E				√				
	Minsk	53-49N/027-29E			√*		√	√	√	
	Murmansk	68-50N/033-48E							√	√
	Novocherkassk	47-22N/040-08E				√				
	Novoshakhtinsk	48-05N/039-36E				√				
	Odessa	46-35N/030-56E				√				
	Omsk	54-42N/073-48E			√	√				
	Opochka	56-42N/028-49E					√			
	Orsha	53-53N/030-23E						√		
	Pionerskiy	54-46N/019-53E					√			
	Piterka	50-29N/047-25E				√				
	Plesetsk	62-33N/040-54E			√					
	Poltava	49-38N/034-33E		√						
	Rezh	57-11N/061-04E				√				
	Rubtsovsk (1)	51-32N/080-55E								√
	Rubtsovsk (2)	51-22N/080-56E								√
	Rubtsovsk (3)	51-29N/081-00E								√
	Rubtsovsk (4)	51-17N/080-32E								√
	Saalty	39-47N/047-12E					√	√		
	Saratov	51-54N/045-58E								√
	Saykhin	48-59N/047-44E				√				
	Sharya	58-12N/046-07E				√				
	Siktyakh	70-48N/122-35E						√		
	Slantsy	58-58N/027-24E				√		√		
	Sosva	59-17N/062-05E				√				
	Stavropol	45-21N/041-51E								√
	St.Petersburg	60-08N/030-34E	√*				√	√		
	Syktyvkar	60-52N/050-18E				√				
	Syzran	53-34N/047-56E				√				
	Tashkent	40-57N/069-16E		√	√	√				
	Telavi	41-58N/045-58E						√		
	Tiksi	71-16N/129-05E					√	√		√
	Tselinograd	51-12N/071-27E								√
	Tula	54-03N/037-40E			√					
	Turakh	72-33N/124-31E						√		
	Ulyanovsk	54-17N/048-25E							√	√
	Uralsk	51-20N/051-30E		√	√					
	Urmary	55-43N/047-51E				√				
	Urzhum	56-52N/048-54E				√				
	Vladivostok	43-05N/131-41E						√		

Table (Cont): Observed Locations of 406 MHz Interference (1991 - 1998)

Country	Nearest Populated Area	Last Estimated Location	1991	1992	1993	1994	1995	1996	1997	1998
CIS (cont.)	Volgograd	48-44N/046-29E	√							
	Yakutsk	61-41N/130-02E							√	
	Yanskaya Nizmennost	72-22N/133-08E						√		
	Yerevan	40-12N/044-35E						√		
	Yerlakh	39-57N/047-24E					√			
	Zhigulevsk	53-22N/049-39E				√				
Colombia	Barranquilla	11-10N/075-07W	√	√						
	La Guarjira	11-37N/072-16W	√							
	Monteria	07-55N/075-41W								√
	Rio Hacha	11-32N/073-19W	√							
	Santa Marta	11-06N/074-11W	√							
Croatia	Canak	44-47N/015-38E				√	√			
	Karlobag	44-46N/014-53E				√				
	Karlovac	45-30N/015-11E				√				
Czech Republic	Kralovice	49-55N/013-50E								√
Dominican Rep.	Puerto Plata	19-28N/070-41W	√							
Ecuador	Balao	03-05S/079-54W						√		
	Loja	04-01S/079-12W			√	√	√	√		
	Morona	03-16S/077-52W						√		
Egypt	Aswan	23-35N/032-43E					√			
	Diqla	30-52N/034-06E				√	√			
	El Arish	31-05N/034-07E				√	√	√		
	Halaib	22-28N/037-27E								√
	Ofira	27-53N/034-20E							√	
	Sadut	30-56N/034-13E				√	√			
	Suez	30-05N/032-35E				√	√			
Estonia	Muhu	58-30N/023-13E				√	√			
	Narva	58-55N/027-49E					√	√		
France	Marseille	43-13N/005-22E								√
French Guiana	Apatou	05-09N/054-21W							√	√
	Citron	05-09N/054-20W					√	√		
Gaza Strip	Abasan	31-21N/034-20E				√	√			
Germany	Berlin	52-11N/013-46E		√	√					
	Burgstadt	51-01N/012-58E		√*	√*					
	Essen	52-45N/007-19E				√*		√*		
	Finterwalde	51-36N/010-37E			√					
	Gotha	51-02N/010-37E			√					
	Juterbog	52-02N/012-54E			√					
	Magdeburg	51-53N/012-27E		√	√					
Ghana	Accra	05-35N/000-21W	√	√						
Greece	Loutra Aidaipsou	39-27N/024-37E								√
Guatemala	Antiqua	14-33N/089-49W				√	√	√	√	
	Guatemala	14-03N/090-45W			√					
Guyana	Waterloo	05-53N/057-10W					√	√		
India	Uri	34-07N/074-23E						√		
Indonesia	Natuna Besar	04-47N/107-06E								√
Iran	Bampur	27-10N/060-16E				√	√	√		
	Birjand	34-19N/057-49E				√	√			
	Shahabad/Ilan	33-51N/046-41E					√	√	√	
	Shushtar	32-03N/049-10E			√	√				
	Tabriz	38-49N/048-47E					√	√		
	Tehran	29-47N/082-37E		√						
	Zabodi	26-08N/066-53E	√			√				
Iraq	Baghdad	Not Available			√					
Israel	Ashdod	33-02N/035-27E	√							
	Haifa	33-40N/035-25E			√	√		√		√
	Jerusalem	32-05N/035-13E			√					
	Nazareth	32-27N/035-21E	√	√						
Italy	Balzano	46-35N/011-45E								√
	Cuneo	44-29N/007-03E								√
	Gioia del Colle	40-38N/017-13E				√		√*		
	Livourne	43-39N/010-20E	√							
	Milan	45-20N/009-13E		√	√					
	Modena	45-38N/010-34E								√
	Turin	45-04N/007-54E		√*	√*					
Japan	Mito	36-04N/140-07E					√	√		
	Nemuro (1)	43-32N/145-41E								√
	Nemuro (2)	43-27N/145-57E								√
Jordan	Amman	31-52N/035-55E			√	√				√
	Irbid	33-43N/035-42E		√						
Kuwait	Al Kuway	29-17N/047-10E	√	√				√		√
Lebanon	Beirut	33-54N/035-30E		√	√	√	√			
Libya	Hon	29-07N/015-57E	√							
	Tobrouk	32-04N/023-57E		√	√					
Malaysia	Kuala Terengganu	05-09N/104-42E								√
	Taiping	04-51N/102-37E		√						
Marshall Islands	Kwajalein	09-22N/167-25E						√		

Table (Cont): Observed Locations of 406 MHz Interference (1991 - 1998)

Country	Nearest Populated Area	Last Estimated Location	1991	1992	1993	1994	1995	1996	1997	1998
Martinique	Caribbean Sea	14-38N/063-32W							√	
Mexico	Campeche	18-01N/090-53W		√						
	Culiacan	24-38N/107-12W						√		
	Merida	21-01N/089-34W								√
	Morelia	19-53N/100-39W				√	√			
	Novillero	20-24N/105-28W							√*	
	Panuco	23-26N/105-49W						√	√*	√**
	Pto. Vallarta	20-25N/105-29W							√*	
	S. Marcos	20-43N/104-13W							√*	
	S. Miguel	20-52N/100-44W	√	√	√					
	S. Nicolas	24-37N/105-29W							√*	
	Zacatian	20-03N/097-33W						√		
Morocco	Casablanca	33-46N/007-38W					√			
	Mohammedia	33-38N/007-25W				√				
	Sidi Kacem	34-15N/006-15W						√		
Nepal	Mugu	29-47N/082-37E			√	√				
New Zealand	Masterton	40-54S/175-48E								√
Nigeria	Harcourt	04-51N/007-06E								√
Oman	Masqat	30-13N/059-37E			√	√				
Pakistan	Islamabad	31-58N/071-06E		√						
	Karachi	24-48N/067-04E	√	√	√	√	√	√		
	Sahiwal	31-59N/072-38E			√	√				
Peru	Atalaya	14-30S/071-15W				√	√			
	Borja	04-37S/076-49W						√		
	Jaliaca-Puno	15-28S/070-02W								√**
	Lagunas	05-19S/075-44W						√		
	Tumbes	03-44S/082-09W		√	√			√		
	Valdivia	04-35S/078-03W						√		
Philippines	Mindoro	13-30N/121-06E		√*						
	Lingayen	16-15N/120-36E								√
Poland	Cracow	50-02N/019-50E						√		
	Nowa Sol	51-27N/015-24E		√*						
	Sanok	49-29N/022-08E					√			
	Wroclaw	51-07N/017-04E			√					
Romania	Bucharest	44-58N/026-15E	√							√
	Tirgu Mures	46-36N/024-58E	√	√						
Slovenia	Ljubljana	46-03N/014-29E	√							
Spain	Almeria	36-41N/002-57E		√*	√*					
	Barbastro	42-04N/000-34E								√
	Barcelona	41-20N/002-05E								√
	Bilbao	43-12N/002-34W				√				
	Madrid	40-29N/003-44W					√*			
	Ronda	36-37N/004-41W					√			
	Villarrobledo	39-33N/002-44W								√
St. Lucia	Vieux Fort	13-34N/061-23W							√	
Surinam	Affobakka	05-09N/054-19W						√		
	Nieuw Nickerie	05-57N/057-01W						√		
Syria	Salkhad	32-38N/036-42E							√	
Tanzania	Kilosa	07-27S/037-05E				√	√	√		√
Thailand	Bangkok	13-26N/099-53E					√			
Turkey	Ankara	Not Available			√					
	Bursa	40-09N/029-36E		√			√	√		
	Kozan	37-18N/036-13E			√					
U.A.E.	Dubai	25-04N/055-19E	√			√	√	√		
Uganda	Entebbe	00-11S/032-42E	√							
USA	Amityville	40-38N/073-24W						√		
	Cedon	38-14N/077-30W							√	
	Ft. Lauderdale	26-02N/080-10W							√	
	Machanicsville	38-26N/076-40W							√*	
	Villas	39-14N/074-58W							√	
Venezuela	Baca Araguao	08-56N/060-16W	√							
	Caracas	10-36N/066-20W	√							
	Guanare	08-59N/069-28W							√	
	Guardatinajas	09-19N/067-51W							√	
	Los Roques	11-50N/066-18W	√							
	Mirimire	11-05N/068-15W	√							
	Mucuchies	08-45N/071-07W							√	
	Puerto Piritu	10-03N/065-15W	√							
	Rosairo	10-52N/072-49W	√							
	San Antonio	09-38N/066-06W							√	
	San Felix	11-07N/071-08W	√							
	San Luis	11-10N/069-37W	√							
	Station Barbara	09-34N/063-29W	√							
Vietnam	Hanoi	21-48N/108-26E		√						
TOTAL			36	36	47	68	60	82	44	71

Notes: √ = Observed.

√* = Observed outside current operating bandwidth of SARP payloads, but within the 406-406.1 MHz bandwidth.

√** = Elimination confirmed in 1998.